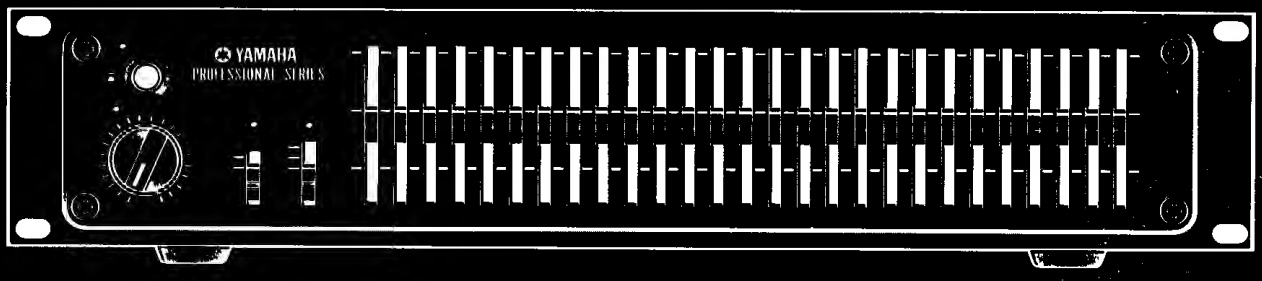
YAMAHA

PROFESSIONAL SERIES

GRAPHIC EQUALIZER

Q1027

OWNER'S MANUAL



FEATURES / CAUTION

The Q1027 is a professional-grade 27-band graphic equalizer that offers top-quality performance, features, reliability and durability. It is perfectly suited to a wide range of professional applications including concert sound reinforcement and studio recording.
Please be sure to read this operation manual carefully in order to make the most of your Q1027's extensive performance capabilities.

CONTENTS

FEATURES

- All inputs and outputs feature Phase Switches, Ground Switches and cannon connectors. Rack-mountable configuration. Rugged to withstand the rigors of professional use. Human-engineered control layout for fast, error-free operation. Elegant styling. Exceptionally high S/N ratio and low distortion.

- 27 1/3-octave equalizer bands provide extremely fine control capability. Unique "L" integrated circuit construction effectively minimizes inductive noise pick-up maintaining excellent signal-to-noise ratio and low distortion.

- Equalizer bypass switch, 40/80 Hz high-pass filter selector, accurate input attenuator and peak level indicator all add up to more convenient, more precise sound control. Removable security cover prevents accidental alteration of settings in studio and sound reinforcement applications. Designed for optimum "in-use" flexibility and performance.

CAUTION

- Locate the Q1027 out of the direct rays of the sun, avoiding locations subject to vibration and excessive dust, heat, cold or moisture.

- When displacing the instruments, be sure to disconnect the power supply cord and every connecting cord to prevent their breakage and short.

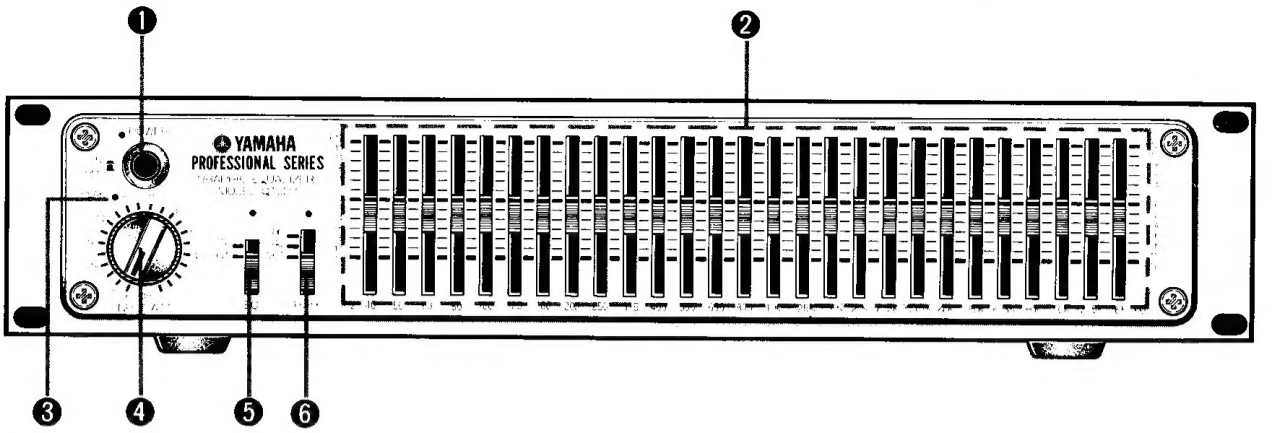
- Do not attempt to clean any accumulations of dirt with chemical solvents (such as alcohol or benzene). Wipe only with a clean completely dry cloth.

- Keep this manual in a safe place for future reference, and refer to it frequently until you are fully familiar with your Q1027.

- This model is designed to be mounted on 19" standard rack.

- Voltage Selector switch on the rear of the Q1027 must be set for your local mains voltage *BEFORE* plugging in the AC main supply. Voltages are 110-130 or 220-240AC, 50/60Hz. U.S. and Canadian models are not provided with the voltage selector.

FRONT PANEL OPERATION



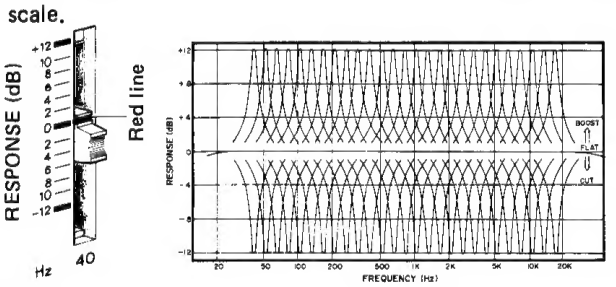
1 POWER switch

When this switch is depressed to the ON position, the power is supplied to the equalizer and the indicator lights. Depress the switch again to set it to the OFF position.

* Between three and five seconds after the switch has been set to ON, the muting circuit is activated in order to suppress the pop noise, produced when the power is initially supplied, and there are no output signals.

2 Equalizer section

Available in this section are the control knobs which are used to increase or reduce the center frequency level of the frequencies in the audible band which is divided into 27 parts. Based on a reference value of 0 dB, the level may be varied up to a maximum of ±12 dB. To set the level, align the red line of the knob with the setting scale.



3 PEAK indicator

This lights when the output level exceeds +21 dB and it warns that the output level is excessively high.

4 INPUT Attenuator

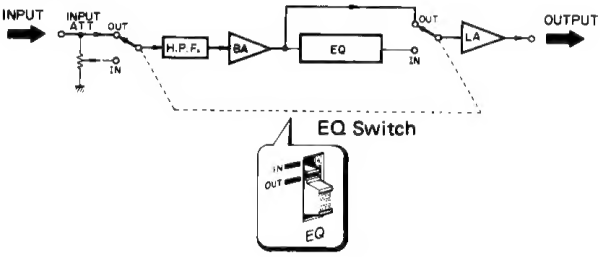
This is used to adjust the input level. When rotated in the counterclockwise direction, it is possible to attenuate the level in 1 dB steps down to −20 dB. At the ∞ position, the input signals are cut off entirely and there is no sound.

When the overall level has risen due to equalizing, take steps to turn down the input level by a value equivalent to the rise in the level and eliminate the difference in level caused by the presence or absence of equalizing.

* The attenuator does not work when the EQ switch is set to the OUT position.

5 EQ (equalizer bypass) switch

This switch isolates the equalizer section and passes the input signals to the output. When the knob is set to IN, the indicator light to indicate that the equalizer section is now working. When it is set to OUT, the indicator goes off, and the input signals bypass the INPUT ATT control and the equalizer section, and they are sent straight to the output. In cases like this, the Q1027 functions as a buffer amplifier, and the EQ switch is used to compare the sound quality with and without equalizing.

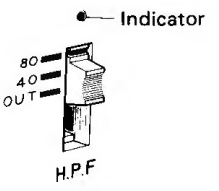


6 HPF (high-pass filter) switch

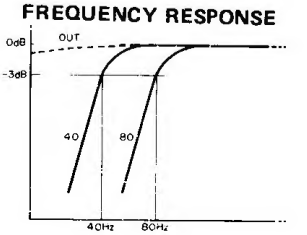
This filter has a slope response of 18 dB/oct and its switch allows selection between a cutoff frequency of 40Hz and 80Hz. At the "40" position, signals with a frequency of less than 40Hz are attenuated, and it is possible to suppress the low-frequency standing waves (low-frequency resonance) produced in studios and small rooms, to eliminate the muddiness in the low range and to obtain a clear-cut sound.

At the "80" position, signals with a frequency of less than 80Hz are attenuated, and it is possible to reduce the "fuzziness" of vocal microphones and the hum and noise of electrical musical instruments, etc.

The indicator light when the switch is set to the "40" and "80" position.

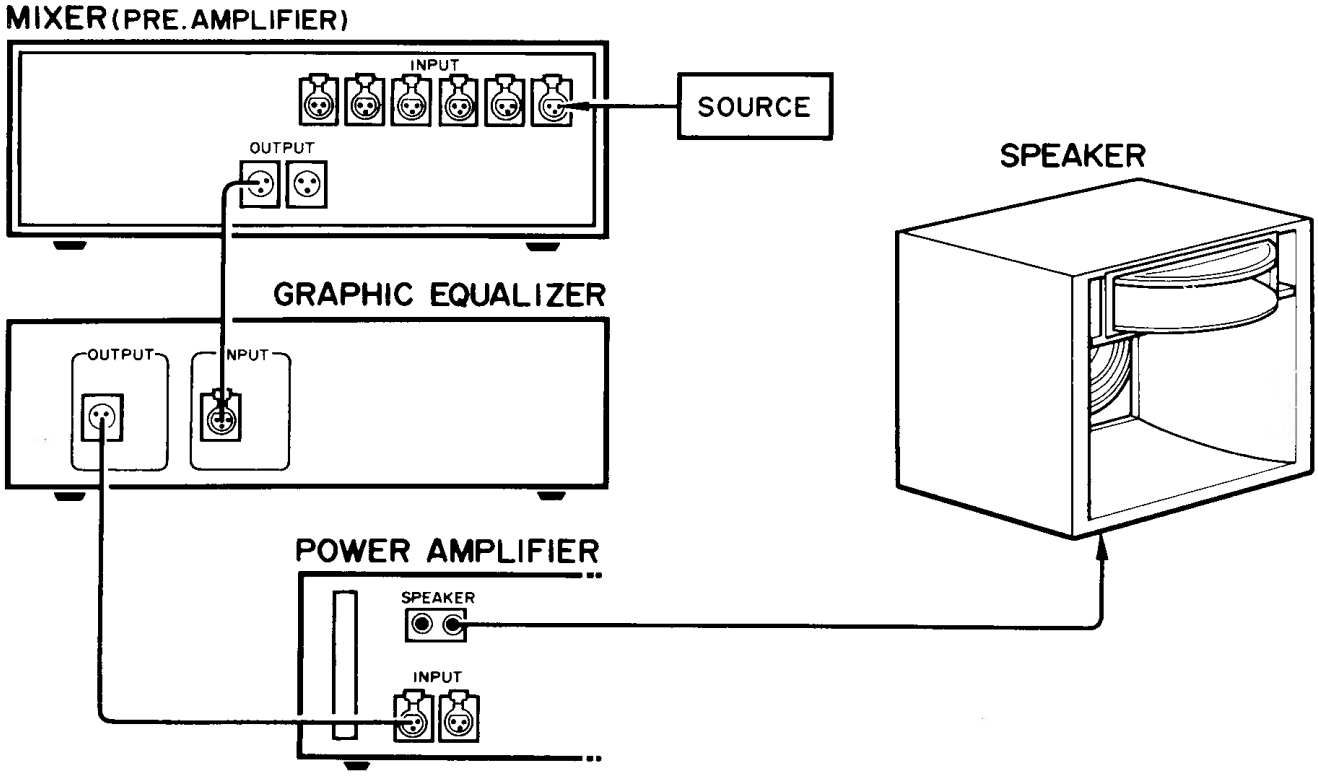


FREQUENCY RESPONSE

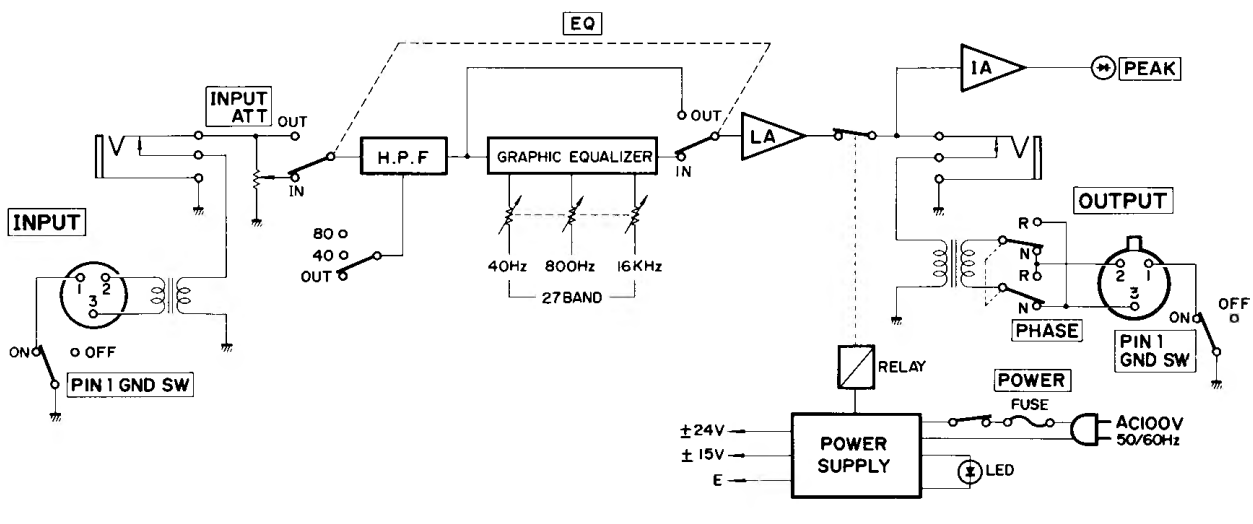


CONNECTION / BLOCK DIAGRAM

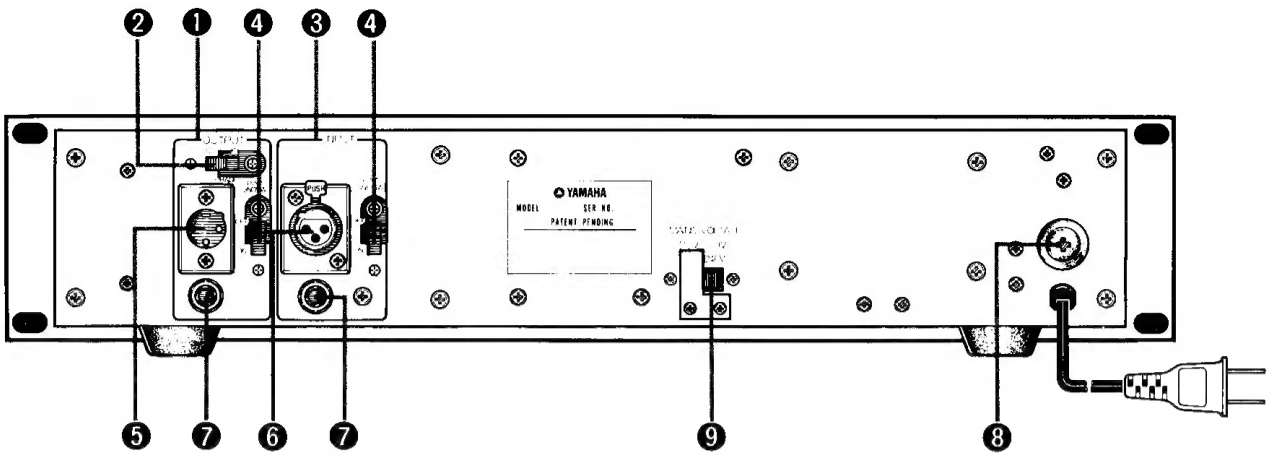
CONNECTION



BLOCK DIAGRAM



REAR PANEL OPERATION



❶ OUTPUT

It is provided with a Cannon socket for balanced output applications and a phone jack for unbalanced output applications. The output impedance in either case is 40 ohms.

* The phone jack output takes priority when both the Cannon socket and phone jack are connected simultaneously.

❷ OUTPUT PHASE switch

This switch selects the phase of the balanced output. Set to the "N" side to match the phases of the input and output and to the "R" side for reverse phase.

The switch is used for phase alignment when many components have been connected or when the phase changes in accordance with the setting position of the speaker system.

* The phase of the phone jack side cannot be selected.

❸ INPUT

It is provided with a Cannon socket for balanced input applications and a phone jack for unbalanced input applications. The input impedance is 8 kiloohms for the balanced input and 10 kiloohms for the unbalanced input.

* The phone jack input takes priority when both the Cannon socket and phone jack are connected simultaneously.

❹ PIN 1 GND switch

This switch sets the balanced output ground line (pin 1 shielded ground) to ON and OFF.

Hum or noise is sometimes caused by the illumination inside the hall and the high-power components when signal cables are used extendedly or when they are used in a certain placement to connect a number of components. This noise can sometimes be reduced by isolating the ground line. In a case like this, use this switch.

❺ Cannon socket XLR-3-32

The Q1027 employs a 3-pin (pin 1 shielded ground, pin 2 hot, pin 3 cold) socket for connection.

Compatible plugs include the Cannon XLR-3-11C and the Switchcraft A-3-F.

❻ Cannon socket XLR-3-31

Compatible plugs include the Cannon XLR-3-12C and the Switchcraft A-3-M.

❼ Phone jacks

These employ standard plugs.

❽ Fuse

Always use a fuse with the same ratings of the existing one for replacement purposes.

❾ VOLTAGE SELECTOR (General Models Only)

Set this to your local AC mains voltage. Failure to do so will result in seriously impaired performance or even severe damage.

EQUALIZING

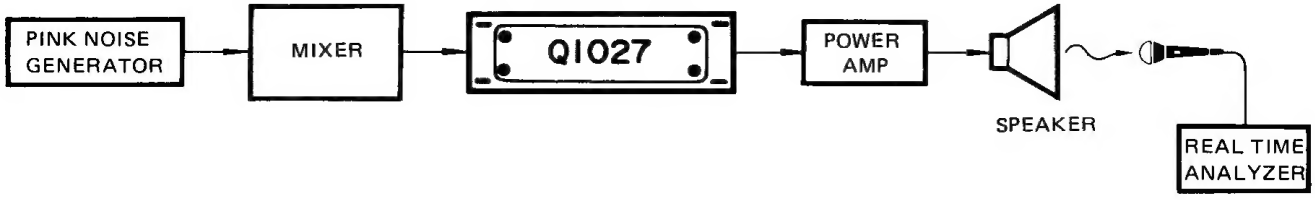
This model divides the audible frequency 40Hz–16kHz by 1/3 octaves into 27 portions to enable extremely intricate compensation. Equalizing can be provided from the twin aspects of indoor transmission response and howl, and it is possible to improve the sound quality at the audience seats by making the indoor transmission response flat, and also to provide a sufficient howl respite for microphones used on the stage.

● Equalizing for correct indoor response

The frequency response curves and specifications provided with speaker units and systems are derived from measurements taken in an "anechoic chamber" (an acoustically "dead" room in which no reflection of sound takes place). When used in a real listening environment such as a hall or club, however, the actual percieved response is highly dependent on the acoustic properties of the listening area. Hard surfaces such as windows, wood panelling and tile floors can reflect the high frequencies causing a "tinny" or "ringing" sound, while curtains, chairs and even people can absorb high frequencies causing a "flat" or "muddy" response. It is therefore essential that the sound reinforcement system be properly equalized to compensate for the specific acoustic conditions in the area where it is to be used. In order to improve the sound quality at the listening position, it is necessary to perform equalizing of the indoor transmission response.

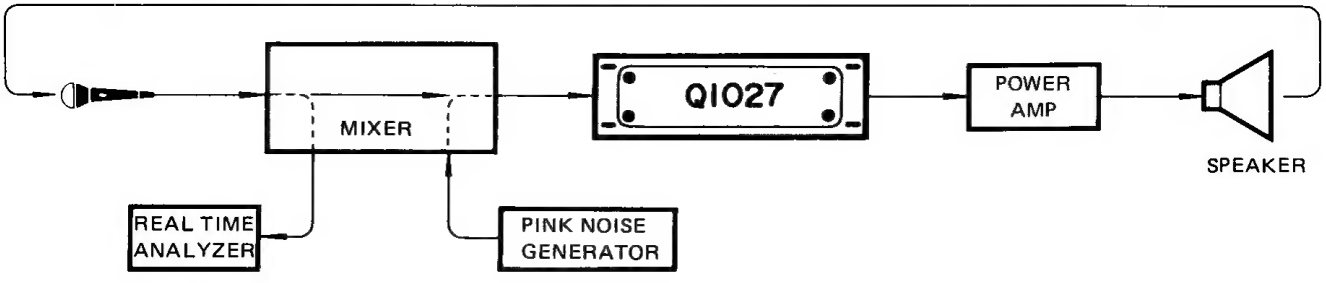
For this kind of equalizing, a pink noise generator and a real time analyzer must be provided as measuring instruments.

Connect the pink noise generator to the PA console mixer and the pink noise is then heard through the speaker. Use the real time analyzer in the service area to measure this noise and adjust the controls on the graphic equalizer so that the indicated transmission response is made flat.



● Equalizing to combat howl

Depending on the acoustics of a hall or room, howl is sometimes heard at a specific frequency. In a case like this, howl can be prevented by reducing the gain only for that frequency where the howl is generated. For accurate equalizing, a pink noise generator and a real time analyzer are useful. Set the microphone on the stage, connect the pink noise generator to the auxiliary input of the PA console mixer and the real time analyzer to the auxiliary output, and then increase the gain. Use the controls on the graphic equalizer to adjust the gain of the frequency where the howl is generated, and if as a result howl is generated at almost every frequency when the gain is increased, it means that the problem of the howl at the original frequency has been resolved.



With compensation using only measuring instruments, the sound is sometimes found to be lacking, and after performing equalizing from the twin aspects of the indoor transmission response and howl, check the sound quality and level balance in the service area by ear, and perform overall adjustment.

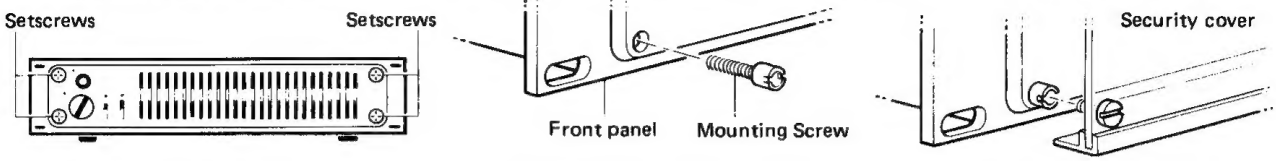
MOUNTING THE SECURITY COVER/SPECIFICATIONS

Mounting the security cover

If the control knobs on the equalizer, once set, are moved by mistake or carelessly when the model is being used in one location only, the controls have to be re-adjusted.

To prevent this kind of trouble, a security cover is provided as an accessory to this model.

Remove the four setscrews of the front panel and then mount the cover using the mounting screws.



(1) Remove the setscrews of the front panel.

(2) Mount the accessory cover mounting screws in place of the front panel's setscrews.

(3) Mount the security cover in line with the mounting screws.

SPECIFICATIONS

Frequency Response	PHONE JACK 20Hz ~ 20kHz (0 ± 0.5dB) XLR 20Hz ~ 20kHz (0 ± 1.5dB)
Total Harmonic Distortion	PHONE JACK less than 0.02% (20Hz ~ 20kHz) XLR less than 0.5% (20Hz ~ 20kHz)
***Hum & Noise**	−100dB (EQ flat, 600 Ω load)
Gain	0dB (EQ by-pass)
Maximum Output Level	+24dB (600 Ω load)
Center Frequencies	40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800 1k, 1.25k, 1.6k, 2k, 2.5k, 3.15k, 4k, 5k, 6.3k, 8k, 10k, 12.5k, 16k(Hz)
Frequency Accuracy	Less than ±5%
Range of Boost/Cut	Boost 0 ~ +12dB, Cut 0 ~ −12dB
High Pass Filter	18dB/oct 40Hz ± 10%, 80Hz ± 10%
Input Impedance	PHONE JACK 10kΩ (unbalanced) XLR 8kΩ (balanced)
Output Impedance	PHONE JACK 40 Ω (unbalanced) XLR 40 Ω (balanced)
Power Source	U.S. & Canadian Models 120V AC 60Hz General Models 110-130 or 220-240AC Selectable, 50/60Hz
Power Consumption	U.S. Model 18W Canadian Model 24VA General Models 20W
Dimensions (W x D x H)	480 x 305 x 95.5 mm (18-7/8" x 12" x 3-3/4") (When security cover mounted 480 x 318 x 95.5 mm, 18-7/8" x 12-1/2" x 3-3/4")
Weight	8 kg (17.6 lbs)

* Measured with −6 dB/oct filter @12.47kHz equivalent to a 20kHz filter with infinite dB/oct attenuation.

● 0 dB is referenced to 0.775 V r.m.s.

Specifications subject to change without notice.

SINCE 1887

YAMAHA

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